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“Step Out From the Old to the New”

IS 3347-1-1 (1979): Dimensions for Porcelain Transformer Bushings for Use in Lightly Polluted Atmospheres, Part 1: Up to and including 1 kV, Section 1: Porcelain Parts [ETD 6: Electrical Insulators and Accessories]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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IS : 3347 ( Part 1/Sec 1 ) - 1979  
( Reaffirmed 1999 )

*Indian Standard*

REAFFIRMED

APR 2004

DIMENSIONS FOR  
PORCELAIN TRANSFORMER BUSHINGS  
FOR USE IN NORMAL AND LIGHTLY  
POLLUTED ATMOSPHERES

PART I UP TO AND INCLUDING 1 kV

Section 1 Porcelain Parts

( *First Revision* )

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**BUREAU OF INDIAN STANDARDS**  
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NEW DELHI 110002

**AMENDMENT NO. 1 FEBRUARY 1989**  
**TO**  
**IS : 3347 ( Part 1/Sec 1 ) - 1979 DIMENSIONS FOR**  
**PORCELAIN TRANSFORMER BUSHINGS FOR USE**  
**IN NORMAL AND LIGHTLY POLLUTED**  
**ATMOSPHERES**

**PART 1 UP TO AND INCLUDING 1 kV**

**Section 1 Porcelain Parts**

*( First Revision )*

*( First cover, pages 1 and 3, title )* — Substitute the following for the existing title:

*‘Indian Standard*

**DIMENSIONS FOR PORCELAIN TRANSFORMER**  
**BUSHINGS FOR USE IN LIGHTLY POLLUTED**  
**ATMOSPHERES**

**PART 1 UP TO AND INCLUDING 1 kV**

**Section 1 Porcelain Part**

*( First Revision )*

*( Page 3, clause 0.3, second line )* }  
*( Page 5, clause 1.1, second line )* } — Delete the words ‘normal and’.  
*( Page 9, Fig. 1 B, Note )* — Delete the ‘Note’.

( ETDC 3 )

*Indian Standard*  
DIMENSIONS FOR  
PORCELAIN TRANSFORMER BUSHINGS  
FOR USE IN NORMAL AND LIGHTLY  
POLLUTED ATMOSPHERES

PART I UP TO AND INCLUDING 1 kV

Section 1 Porcelain Parts

( *First Revision* )

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( *Continued on page 2* )

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**IS : 3347 ( Part I/Sec 1 ) - 1979**

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## *Indian Standard*

# DIMENSIONS FOR PORCELAIN TRANSFORMER BUSHINGS FOR USE IN NORMAL AND LIGHTLY POLLUTED ATMOSPHERES

## PART I UP TO AND INCLUDING 1 kV

### Section 1 Porcelain Parts

### *( First Revision )*

## 0. FOREWORD

**0.1** This Indian Standard ( Part I/Sec 1 ) ( First Revision ) was adopted by the Indian Standards Institution on 27 July 1979, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** This standard was first issued in 1965. In this revision, in place of the four slots arranged cross-wise provided formerly in the case of lower insulator for 250 A, and 630 A, provision has been made for two diametrically opposite slots in the upper portion and two displaced 90° in the lower portion. In the case of porcelains for 1 000, 2 000 and 3 150 A, these slots are dispensed with in lower insulators on mechanical grounds. Ventilation of these bushings takes place through the slotted sealing rings ( see Section 2 ).

**0.3** This standard ( Part I ) covers the dimensions of porcelain transformer bushings for use in normal and lightly polluted atmospheres of up to and including 1 kV with the object of ensuring their interchangeability. To avoid multiplicity of sizes, the dimensions given are only for those ratings ( voltage and current ) which are being used appreciably. This part is being prepared in two sections. This section ( Section 1 ) covers the porcelain parts of the bushings. Section 2 covers the dimensions of the metal parts of the bushings to go with the porcelain parts of Section 1.

**0.4** The dimensions given in this standard ( Part I/Sec 1 ) have been arrived at after a full consideration of the available sizes and an examination of the relevant merits of different types of bushings.



**IS : 3347 ( Part I/Sec 1 ) - 1979**

Detailed dimensions have been given with a view to achieving maximum economy in the manufacture of bushings. The porcelain parts covered by this standard shall also conform to IS : 5621-1979\* unless otherwise stated in this standard.

**0.5** The bushings are rated in terms of the highest system voltage ( *see* IS : 2099-1973† ). The dimensions of bushings for other voltages are covered by the following parts of this standard:

Part II 3.6 kV bushings

Section 1 Porcelain parts

Section 2 Metal parts

Part III 12 and 17.5 kV bushings

Section 1 Porcelain parts

Section 2 Metal parts

Part IV 24 kV bushings

Section 1 Porcelain parts

Section 2 Metal parts

Part V 36 kV bushings

Section 1 Porcelain parts

Section 2 Metal parts

Part VI 72.5 kV bushings

Section 1 Porcelain parts

Section 2 Metal parts ( *under preparation* )

Part VII 123 kV bushings

Section 1 Porcelain parts

Section 2 Metal parts ( *under preparation* )

**0.6** The dimensions for porcelain transformer bushings for use in heavily polluted atmospheres are covered by the series of IS : 8603.

**0.7** For bushings of up to and including 1 kV, 2-piece porcelain insulators have been recommended.

**0.8** The dimensions covered in this standard essentially apply to bushings used outdoors with inner ends immersed in oil and suitable for normal and lightly polluted atmospheres.

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\*Specification for hollow insulators for use in electrical equipment ( *first revision* ).

†Specification for bushings for alternating voltages above 1 000 volts ( *first revision* ).

**0.9** The performance requirements of the bushings covered in this part of the standard are given in IS : 7421-1974\*.

**0.10** In the preparation of this standard, assistance has been derived from DIN 42530 ( 1968 ) 'Indoor and outdoor transformer bushings, voltage class 1 kV, 250 to 3 150 A', issued by Deutscher Normenausschuss.

**0.11** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## **1. SCOPE**

**1.1** This standard ( Part I/Sec 1 ) lays down the dimensions of porcelain parts of bushings for use in normal and lightly polluted atmospheres of up to and including 1 kV used with transformers.

## **2. PORCELAIN PARTS**

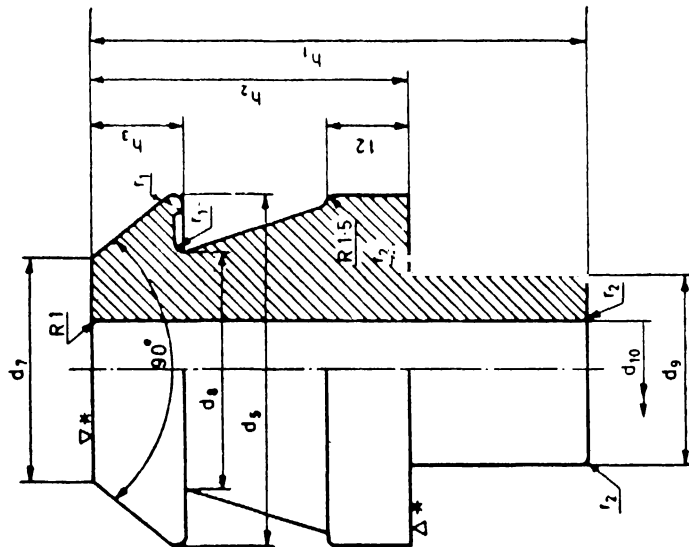
**2.1** The dimensions of the porcelain parts for the different ratings of bushings are given in Fig. 1.

**2.2** Unless otherwise mentioned, the tolerance on the porcelain parts shall be  $\pm (0.03 d + 0.3)$  mm,  $d$  being the dimension in millimetres.

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\*Specification for porcelain bushing for alternating voltages up to and including 1000 V.

†Rules for rounding off numerical values ( revised ).



Rating, kV/A	$d_5$	$d_7$	$d_6$	$d_8$	$d_{10}$	$h_1$	$h_2$	$r_1$	$r_2$
Up to and including 1/250	50	32	34	$27^{+0}_{-2}$	$14^{+1}_{-0}$	$70^{+0}_{-5}$	$45^{+3}_{-0}$	2.5	1
" " 1/630	70	47	49	$43^{+0}_{-3}$	$22^{+2}_{-0}$	$80^{+0}_{-5}$	$55^{+4}_{-0}$	3	1
" " 1/1 000	90	65	67	$53^{+0}_{-4}$	$32^{+3}_{-0}$	$85^{+0}_{-6}$	$55^{+4}_{-0}$	3	1.5
" " 1/2 000	104	80	82	$66^{+0}_{-5}$	$44^{+3}_{-0}$	$85^{+0}_{-6}$	$55^{+4}_{-0}$	3	1.5
" " 1/3 150	125	100	100	$86^{+0}_{-6}$	$50^{+4}_{-0}$	$85^{+0}_{-6}$	$55^{+4}_{-0}$	3	1.5

\*Unglazed.

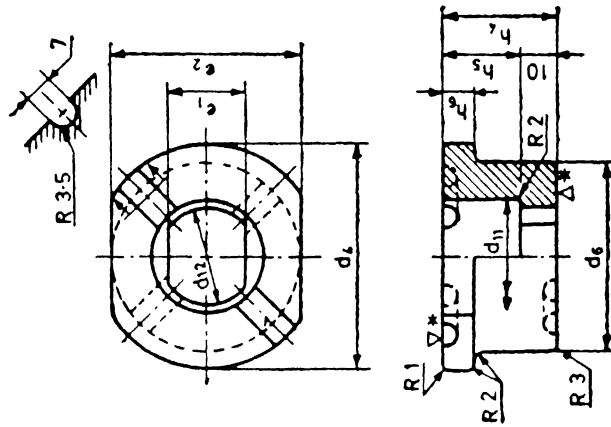
△Surfaces ground parallel to each other and perpendicular to axis.

All dimensions in millimetres.

1A Upper Insulator

FIG. 1 PORCELAIN INSULATOR FOR 1/250, 630, 1 000, 2 000 AND 3 150 BUSHINGS

( Continued )



Rating, kV/A	$d_4$	$d_4$ and $d_5$	$d_{11}$	$d_{13}$	$e_1$	$h_4$	$h_5$	$h_6$	$r_3$
Up to and including 1/250	60	50	$30^{+2}_{-0}$	$26^{+2}_{-0}$	$20^{+2}_{-0}$	$30^{+2}_{-0}$	$20^{+2}_{-0}$	8	2
" " 1/630	85	70	$46^{+3}_{-0}$	$41^{+3}_{-0}$	$28^{+2}_{-0}$	$30^{+2}_{-0}$	$20^{+2}_{-0}$	8	3
" " 1/1 000	110	90	$57^{+4}_{-0}$	$46^{+3}_{-0}$	$37^{+3}_{-0}$	$35^{+3}_{-0}$	$25^{+2}_{-0}$	10	4
" " 1/2 000	125	104	$70^{+5}_{-0}$	$64^{+4}_{-0}$	$51^{+4}_{-0}$	$35^{+3}_{-0}$	$25^{+2}_{-0}$	10	4
" " 1/3 150	150	125	$90^{+6}_{-0}$	$80^{+5}_{-0}$	$61^{+4}_{-0}$	$35^{+3}_{-0}$	$25^{+2}_{-0}$	12	4

NOTE — This figure has been shown with slots. These slots are required for 250 and 630 A lower insulator.

\*Unglazed.

△Surfaces ground parallel to each other and perpendicular to axis.

9

All dimensions in millimetres.

IB Lower Insulator

FIG. 1 PORCELAIN INSULATOR FOR 1/250, 630, 1 000, 2 000 AND 3 150 BUSHINGS

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